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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/752,955	01/07/2004	Gopal Ramachandran	Q90773	4429

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EXAMINER	
SEVER, ANDREW T	

ART UNIT	PAPER NUMBER
2851	

DATE MAILED: 12/05/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/752,955	RAMACHANDRAN ET AL.	
	Examiner	Art Unit	
	Andrew T. Sever	2851	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *25 September 2006*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,3-21 and 23-42* is/are pending in the application.

4a) Of the above claim(s) *13-15 and 31-33* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,3-12, 16-21, 23-30, and 34-42* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *27 October 2005* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

1. Claims 13-15 and 31-33 are withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to a nonelected species, there being no allowable generic or linking claim. Applicant timely traversed the restriction (election) requirement in the reply filed on 4/25/2005.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

4. Claims 1, 3, 6-12, 16, 17, 21, 23, 26-30, 34, 35, and 39-42 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hiller et al. (US 6,233,024 as cited in the previous office action) in view of Tejima et al. (US 5,274,406 as cited in the previous office action.)

Hiller teaches in figure 4 an off-axis projection system for displaying an optical image on a display surface based on input image data, comprising:

(a) An image-processing unit for receiving the input image data representing a two-dimensional array of pixels (a typical projected image is made of a two-dimensional array of pixels (multiple lines of pixels)) and generating distortion-compensated image data (see column 2 lines 56-67);

(b) A projection light engine (1) coupled to the image processing unit for receiving the distortion-compensated image data and projecting a distortion-compensated optical image that corresponds to the distortion-compensated image data; and,

(c) An optical reflection assembly (3 also see figure 6 which teaches more then one mirror) coupled to the projection light engine, said optical reflection assembly comprising at least one curved mirror (3 is curved in figure 4), said curved mirror being positioned in the optical path of the distortion-compensated optical image emerging from a projection lens for producing a displayed optical image with reduced distortion on the display surface;

Wherein, said image processing unit is adapted to distortion-compensate the optical image represented by the input image data such that when said distortion-compensated optical image is projected through the projection light engine and reflected off the optical reflection assembly, the optical and geometric distortions associated with

said projection light engine and the optical reflection assembly are substantially eliminated in the displayed optical image (again see column 2 lines 56-67.)

Hiller, however, does not teach that the at least one curved mirrors is an aspherical rotationally non-symmetric mirror having a vertically oriented concave surface and a horizontally oriented surface with a varying degree of concave or convex curvature on an upper surface that smoothly transitions to a varying degree of convex curvature on a lower surface for reducing spatial distortion on the displayed optical image. Tajima teaches in figure 13c a projector similar to that of Hiller. Figure 14a of Tajima shows a mirrored surface that is curved in the claimed manner. Tajima teaches in column 4 lines 35-59 that rear projection displays such as Hiller can be made thinner if the distortion caused by the inclination of the optical axis of the projection lens is compensated for. The curved mirror taught by Tajima in figure 13c compensates for the distortions caused by the inclination. Accordingly since it is desirable to make the display as thin as possible while eliminating distortions; it would have been obvious to one of ordinary skill in the art at the time the invention was made to use a curved mirror as taught by Tajima in the projection system of Hiller.

With regards to applicant's claim 3:

See figures 13F and elsewhere of Tajima.

With regards *to applicant's claim 6:*

This is what image processors primarily do (taking the image data and putting it in a form usable by the projection light engine.)

With regards to applicant's claim 7:

Hiller includes a light generator (1), a display device (the projection lens or round part of the box forming the light generator, and projection optics

With regards to applicant's claim 8:

Clearly the lens of Tajima is offset from the display axis.

With regards to applicant's claims 9 and 10:

Hiller is off-axis for purposes of improving MTF.

With regards to applicant's claim 11:

The projector of Hiller includes a light generator (r-g-b laser(s)), a micro display (a deflector) and as can clearly be seen such as in figure 9c of Tajima lens elements. (See column 3 of Hiller for the specific parts.)

With regards to applicant's claim 12:

See column 2 lines 56-67 of Hiller, which teaches that the micro-display device is caused to display an image that it is compensated for keystone and other spatial distortions.

With regards to applicant's claim 16:

Clearly both Hiller and Tejima are rear projection type projection systems.

With regards to applicant's claim 17:

See figure 15A of Tejima wherein the curved mirror of Tejima (figure 14 a) is replaced with a Fresnel type mirror.

With regards to applicant's claims 21, 23, 26-30, 34, and 35:

See above wherein the method of using the projection system of Hiller in view of Tajima is obvious. (MPEP 2112.02). (See column 2 lines 56-67 of Hiller which state that a computing device receives input image data, recalculates it with respect to distortion in a virtually undistorted form and in view of Tajima is reflected off of an optical reflection assembly meeting applicant's step c.)

With regards to applicant's claims 39-42:

See above wherein the at least one mirror of Hiller in view of Tajima meets the claimed curved mirror.

5. Claims 4, 5, 24 and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hiller in view of Tajima as applied to claim 1, 3, 6-12, 16, 17, 21, 23, 26-30, 34, 35, and 39-42 above, and further in view of Suzuki et al. (US 2004/0046944 as cited in the previous office action.)

As described in more detail above Hiller in view of Tajima teaches a projection system and associated method, which among other things includes a curved mirror. Hiller, however, does not teach a lens that is an aspherical rotationally non-symmetric lens positioned prior to the curved mirror. Suzuki teaches in figure 1 a projection optical system including a mirror (16) and a lens (15). Suzuki teaches in paragraphs 22-26 that the lens is an aspherical lens, which is designed to cancel the curvature of field of the reflecting part. Accordingly since it is desirable to eliminate such aberrations it would have been obvious to include the lens of Suzuki in the projector of Hiller in view of Tajima.

With regards to applicant's claims 24 and 25:

See above wherein the method of using the projection system above is obvious (See MPEP 2112.02).

6. Claims 18-20 and 36-38 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hiller in view of Tajima as applied to claims 1, 3, 6-11, 12, 16, 17, 21, 23, 26-30, 34, 35, and 39-42 above, and further in view of Nishizawa (US 2004/0032982 as cited in the previous office action.)

As described in more detail above Hiller teaches a projection system which among other things includes an image processing unit. Hiller does not specifically teach what the image-processing unit comprises of. Nishizawa teaches in paragraphs 12-14 that it is beneficial for the image processing unit to include a luminance correction stage which individually processes different spectral pass bands as claimed in applicant's claim 19, 20, 37, and 38. Nishizawa states that by making these corrections the unnatural image displayed by the prior art can be corrected for. Accordingly it would have been obvious to one of ordinary skill in the art at the time the invention was made to include the luminance correction of Nishizawa in the image-processing unit of Hiller.

Response to Arguments

7. Applicant's arguments filed 9/25/2006 have been fully considered but they are not persuasive.

Applicant first argues that the addition of the limitation of the input image data representing a two-dimensional array of pixels overcomes the Hiller reference. Specifically applicant argues that unlike applicant's disclosed invention, which displays an entire two-dimensional array at

one time, Hiller raster scans the image, at best displaying the image line by line, which one of ordinary skill in the art would not consider to be a two-dimensional array. While this may be true, it is irrelevant as the actual input image data; that which is received by the image processing unit would be the same for both Hiller and the present invention since it is external input image data. Further those of ordinary skill in the art would recognize that the input image data in whatever form it came in would represent a two-dimensional array of pixels at least in the common television application. Accordingly applicant's argument is not persuasive since applicant's claim language does not address how the image is formed which may differ between the Hiller reference and the disclosed invention rather it only addresses what form the input image takes which would be identical across the most common application.

Applicant additionally argues that that the large mirror of Hiller (3) is not provided for distortion correction. This is irrelevant since the Tejima reference is being provided in the 35 U.S.C. § 103 rejection to provide the teaching of replacing the large mirror of Hiller with a mirror that does provide further distortion correction due to the off axis nature of the projection in a rear projection cabinet and to allow for the cabinet to be made smaller. Applicant's argument of Hiller's mirror (3) on page 16 of applicant's arguments is an attempt to argue the references individually which cannot be used to show nonobviousness where the rejections are based on combinations of references (see *In re Keller* 208 USPQ 871 (CCPA 1981) and *In re Merck & Co., Inc.,* 231 USPQ 375 (Fed. Cir. 1986).)

On page 17 of applicant's arguments; applicant argues that Tejima uses the large mirror for distortion correction and no image processing for distortion correction. Again applicant is arguing the references individually. The Tejima reference is not being provided to teach image processing only the specific mirror for distortion correction.

Applicant also argues that the mirror of Tejima includes concaved surface whereas the claimed mirror of the present invention does not. Applicant is directed towards part C of claim 1 of the present applicant, which claims that the mirror includes varying degrees of "concave or convex curvature". Accordingly applicant's argument is not found persuasive.

On page 18 applicant appears to be arguing that Hiller and Tejima are non-analogous prior art. The office disagrees. Both use raster scanning to produce the image and both correct for distortions. Accordingly applicant's argument is not found persuasive.

It should further be noted that Hiller's dynamically varying scanning mirrors are its modulation means and are driven accordingly to distortion-compensated image data to produce distortion compensated images.

Accordingly applicant's argument's with regards to claims 1, 3-20, 21, 23-38 are not found persuasive and the rejections have been repeated with minor modifications for clarity and to reflect applicant's amendment. The rejections have been made final.

With regards to applicant's claims 3 and 17, applicant argues that the mirror of Tejima is not curved, as it is a Fresnel mirror. While it is true that the mirror of Tejima is made flat as possible by using Fresnel form, it is still a curved mirror meeting applicant's claims limitations it simply is much more complex then applicant's claimed mirror having been made into a Fresnel mirror. See column 6 line 60 through column 7 line 52 which describes how the mirror in one embodiment is made.

With regards to claims 6-8, 16, 21, 23, 26-30, 34, 35, and 39-42:
Applicant simply argues the above arguments which have been shown not to be persuasive and therefore the rejection of claims 6-8, 16, 21, 23, 26-30, 34, 35, and 39-42 are repeated and made final.

With regards to claims 9-11: Applicant argues that a mechanical laser raster projection system does not include a display device, the office disagrees. The raster system meets the definition of a display device and accordingly applicant's argument's are not found persuasive.

With regards to claims 4, 5, 24, and 25; applicant argues the references individually which has been shown above is not sufficient to overcome a 35 U.S.C. § 103 rejection based on the combination of 3 references.

With regards to claims 18-20 and 36-38: Applicant argues that Nishizawa does not teach processing the luminance data on a frequency band level. While this may or may not be true, it

should be noted that no-where in applicant's claims is their any limitation requiring that the luminance correction stage perform such correction. The only requirement is that the projection system include an image processing unit having an luminance correction stage which as acknowledge by applicant in the first paragraph of applicant's arguments page 26 Nishizawa teaches and that the projection system include an image warping stage which is taught as outlined above by Hiller in view of Tajima. Accordingly applicant's argument is not found persuasive, the rejection is repeated and made final.

Conclusion

8. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Andrew T. Sever whose telephone number is 571-272-2128. The examiner can normally be reached on 8:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Diane Lee can be reached on (571) 272-2399. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

AS

William Perkey
Primary Examiner